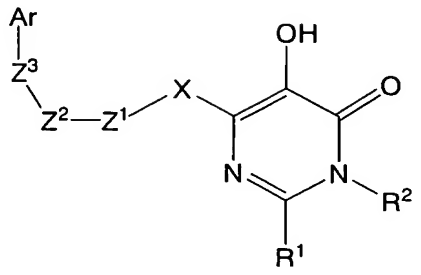
[CLAIMS]

1. A compound of the formula:

[Formula 1]

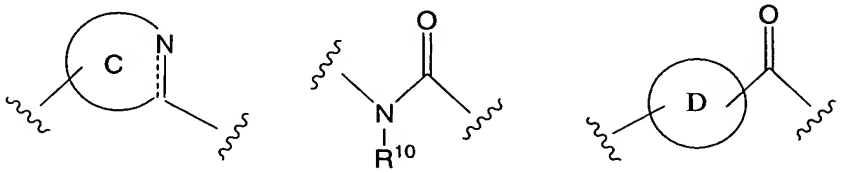


(I)

(wherein:

X represents either one of the following groups:

[Formula 2]



(a) (b) (c)

(wherein, C ring is nitrogen-containing aromatic heterocyclic ring in which at least one of atoms neighboring the atom bound to the pyrimidine ring is unsubstituted nitrogen atom; R^{10} is hydrogen or lower alkyl; D ring is aryl or heteroaryl)

Z^1 and Z^3 each is independently a single bond, O, S, S (=O) or SO_2;

Z^2 is a single bond, lower alkylene or lower alkenylene;

Ar is optionally substituted aryl or optionally substituted heteroaryl;

R^1 is lower alkyl, substituted lower alkyl, optionally substituted cycloalkyl, optionally substituted cycloalkyl lower alkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heterocyclic group, or optionally substituted heterocyclic lower alkyl;

R^2 is a hydrogen atom or optionally substituted lower alkyl; or

R^1 and R^2 may form, together with an adjacent atom, an optionally

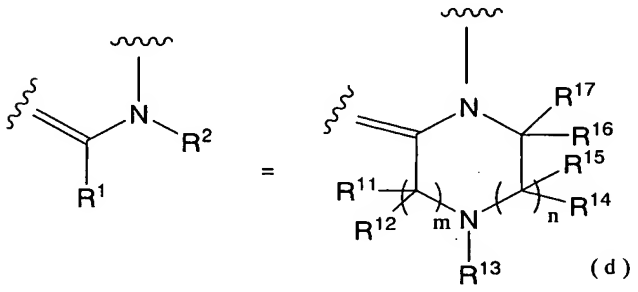
substituted heterocyclic ring,

provided that

1) when X is a group shown by (a), R^1 is not lower alkyl

2) when X is a group shown by (b), R^1 and R^2 form, together with an adjacent atom, a heterocyclic ring shown by the (d) as follows:

[Formula 3]



(d)

(wherein, R^{11}, R^{12}, R^{14}, R^{15}, R^{16}, and R^{17} each is independently hydrogen, optionally substituted lower alkyl, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted amino, optionally substituted hydroxy, optionally substituted thiol, optionally substituted sulfonyl, optionally substituted aminosulfonyl, or optionally substituted carbamoyl, or

R^{11} and R^{12}, R^{14} and R^{15}, and R^{16} and R^{17} may together form "=O";

R^{13} is hydrogen, optionally substituted lower alkyl, optionally substituted lower alkylcarbonyl, optionally substituted lower alkylsulfonyl, optionally substituted carbamoyl, optionally substituted arylcarbonyl, optionally substituted aralkyl, optionally substituted heteroaralkyl, or optionally substituted heteroarylcarbonyl;

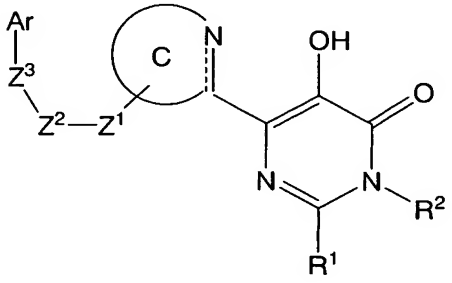
m is 0, 1, 2 or 3; n is 0, 1, 2 or 3; provided that 1=m+n=3)), a pharmaceutically acceptable salt or a solvate thereof.

2. The compound according to claim 1, wherein Z^1 is a single bond or O; Z^2 is a single bond or lower alkylene; Z^3 is a single bond; and Ar is optionally substituted phenyl, a pharmaceutically acceptable salt or a solvate thereof.

3. The compound according to claim 2, wherein $-Z^1-Z^2-Z^3-Ar$ is

4-fluorobenzyl, a pharmaceutically acceptable salt or a solvate thereof.

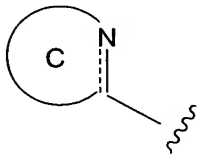
4. The compound according to claim 1 represented by the formula:
[Formula 4]



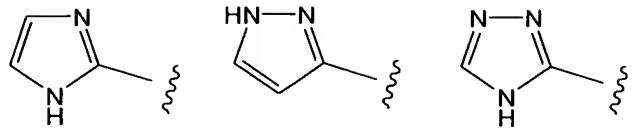
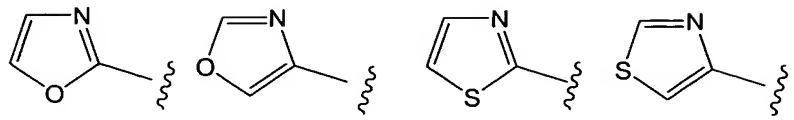
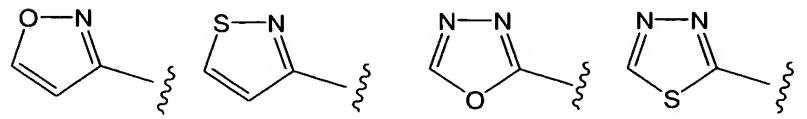
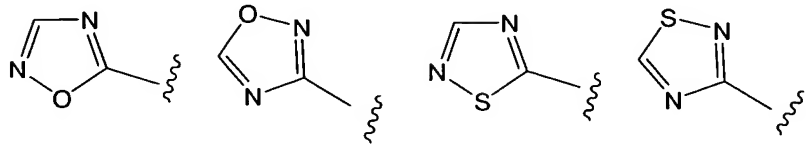
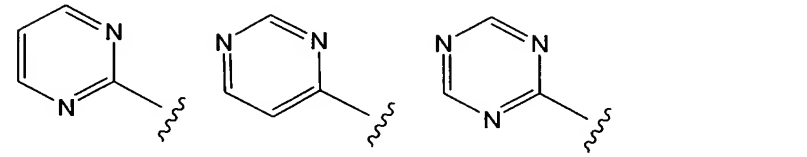
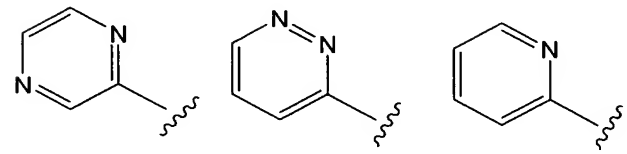
(I-a)

(wherein each symbol has the same meanings as claim 1), a pharmaceutically acceptable salt or a solvate thereof.

5. The compound according to claim 4, wherein C ring represented by the formula:
[Formula 5]



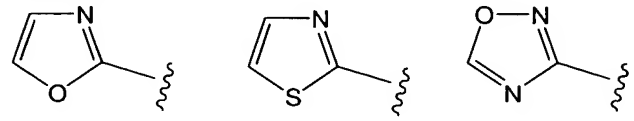
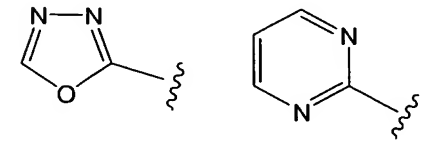
is selected from the group consisting of:
[Formula 6]

, a pharmaceutically acceptable salt or a solvate thereof.

6. The compound according to claim 5, wherein C ring is selected from the group consisting of:

[Formula 7]

, a pharmaceutically acceptable salt or a solvate thereof.

7. The compound according to claim 1, wherein R^1 is substituted lower alkyl, optionally substituted cycloalkyl, optionally substituted aralkyl, optionally substituted heterocyclic lower alkyl, optionally substituted aryl or optionally substituted heterocyclic group, and each substituent is selected from the group consisting of $-NR^3R^4$, $-C(=O)R^3$, $-C(=O)NR^3R^4$ (wherein, R^3 and R^4 each is independently , hydrogen atom, hydroxy, alkoxy, optionally substituted aryloxy, optionally substituted aralkyloxy, optionally substituted amino, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heterocyclic group, optionally substituted aralkyl, optionally substituted heteroaralkyl, optionally substituted lower alkylcarbonyl, optionally substituted arylcarbonyl, optionally substituted heteroarylcarbonyl, optionally substituted carbamoyl, optionally substituted carbamoylcarbonyl, lower alkoxycarbonylcarbonyl, carboxycarbonyl, lower alkoxycarbonyl, optionally substituted heterocyclic carbonyl, lower alkylsulfonyl, optionally substituted arylsulfonyl, optionally substituted heteroarylsulfonyl, or optionally substituted lower alkylsulfonyl), oxo and halogen, a pharmaceutically acceptable salt or a solvate thereof.

8. The compound according to claim 1, wherein R^1 is a group selected from the group consisting of:
[Formula 8]

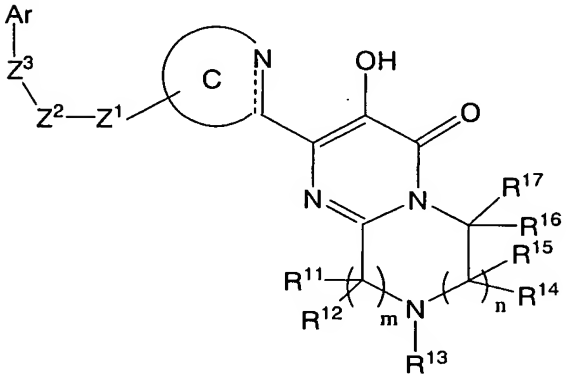
(wherein, R^3 and R^4 are the same meanings as above)
, a pharmaceutically acceptable salt or a solvate thereof.

9. The compound according to claim 1, wherein Z^1 is a single bond or O; Z^2 is a single bond or lower alkylene; Z^3 is a single bond; Ar is optionally substituted phenyl; X is a group

represented by (a); C ring is a group as recited in claim 5 or 6; and R^1 is a group as recited in claim 7 or 8, a pharmaceutically acceptable salt or a solvate thereof.

10. The compound according to claim 4, wherein X is a group represented by (a); R^1 and R^2 form, together with an adjacent atom, an optionally substituted heterocyclic ring, a pharmaceutically acceptable salt or a solvate thereof.

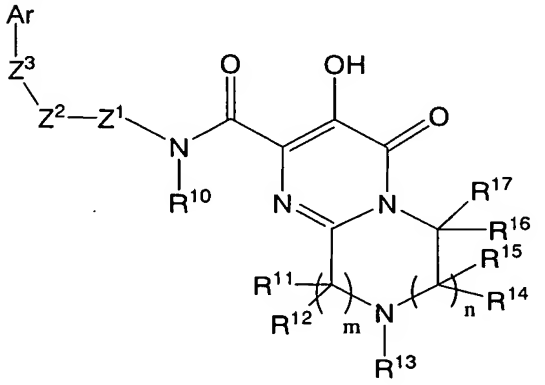
11. The compound according to claim 4 of the formula:
[Formula 9]



(I-a-1)

(wherein each symbol is the same meanings as claim 1), a pharmaceutically acceptable salt or a solvate thereof.

12. The compound according to claim 1 of the formula:
[Formula 10]



(I-b-1)

(wherein each symbol is the same meanings as claim 1)
, a pharmaceutically acceptable salt or a solvate thereof.

13. The compound according to claim 11 or 12, wherein Z^1 is a single bond or O; Z^2 is a single bond or lower alkylene; Z^3 is a single bond; and Ar is optionally substituted phenyl, a pharmaceutically acceptable salt or a solvate thereof.

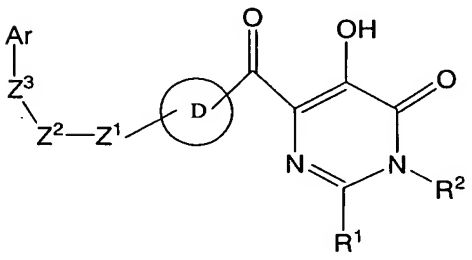
14. The compound according to claim 11 or 12, wherein m is 1, and n is 0 or 1, a pharmaceutically acceptable salt or a solvate thereof.

15. The compound according to claim 11 or 12, wherein R^{11} and R^{12} each is independently hydrogen or lower alkyl; R^{14} and R^{15} both are hydrogens, or together form "=O"; and R^{16} and R^{17} each is independently hydrogen or lower alkyl, a pharmaceutically acceptable salt or a solvate thereof.

16. The compound according to claim 11 or 12, wherein m is 1, n is 0 or 1; R^{11} and R^{12} each is independently hydrogen or lower alkyl; R^{14} and R^{15} both are hydrogens, or together form "=O"; and R^{16} and R^{17} each is independently hydrogen or lower alkyl, a pharmaceutically acceptable salt or a solvate thereof.

17. The compound according to claim 1 represented by the formula:

[Formula 11]



(I-c)

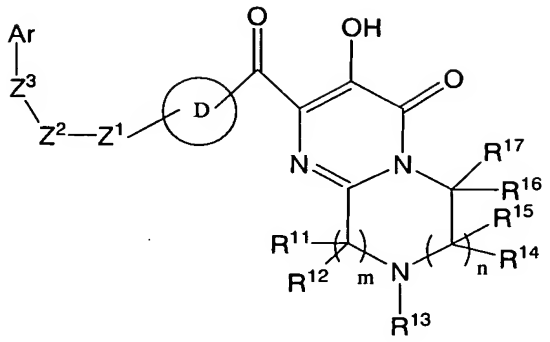
(wherein each symbol is the same meanings as claim 1)

, a pharmaceutically acceptable salt or a solvate thereof.

18. The compound according to claim 1 represented by the

formula:

[Formula 12]



(I-c-1)

(wherein each symbol is the same meanings as claim 1), a pharmaceutically acceptable salt or a solvate thereof.

19. The compound according to claim 17 or 18, wherein D ring is furan, a pharmaceutically acceptable salt or a solvate thereof.

20. The pharmaceutical composition comprising a compound according to any one of claims 1 to 19, a pharmaceutically acceptable salt or a solvate thereof.

21. The pharmaceutical composition according to claim 20 which is an antiviral agent.

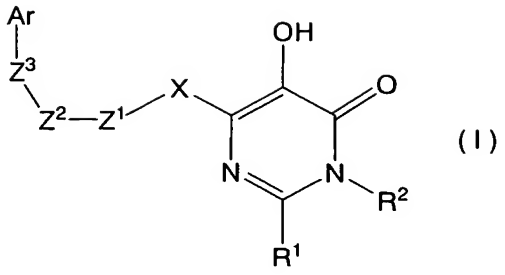
22. The pharmaceutical composition according to claim 20 which is an HIV integrase inhibitory agent.

ABSTRACT OF DISCLOSURE

To provide novel compounds, pharmaceuticals containing the same, especially anti-HIV agents having antiviral activity, especially inhibitory activity against HIV integrase.

A compound of the formula:

[Formula 1]

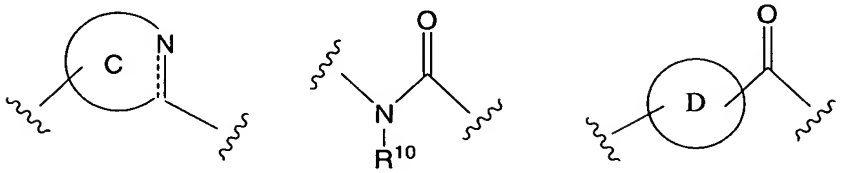


(I)

(wherein:

X represents either one of the following groups:

[Formula 2]



(a) (b) (c)

(wherein, C ring is nitrogen-containing aromatic heterocyclic ring in which at least one atom in atoms neighboring the atom bound to the pyrimidine ring is unsubstituted nitrogen atom; R^{10} is hydrogen or lower alkyl; D ring is aryl or heteroaryl)

Z^1 and Z^3 each is independently a single bond, O, S, S (=O) or SO_2;

Z^2 is a single bond, lower alkylene or lower alkenylene;

Ar is optionally substituted aryl or optionally substituted heteroaryl;

R^1 is lower alkyl, substituted lower alkyl or the like;

R^2 is a hydrogen atom or optionally substituted lower alkyl; or R^1 and R^2 may form, together with an adjacent atom, an optionally substituted heterocyclic ring, a pharmaceutically acceptable salt or a solvate thereof.